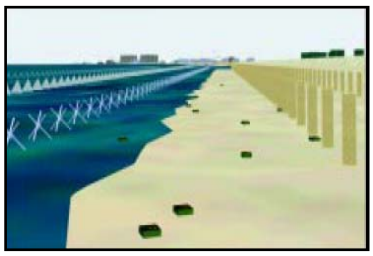
US Army Corps of Engineers®
Engineer Research and Development Center

M&S Terrain Databases
Dynamic Synthetic Environments

Topographic Engineering Center and the Joint Forces Command have developed an advanced Synthetic Environments capability for use in Modeling and Simulation (M&S) applications. Dynamic terrain and object models allow real-time changes to natural and cultural features, including: 1) multi-state terrain and targets with conditions ranging from healthy to completely destroyed, 2) authoritative representations of combat engineering activities, developed in collaboration with the U.S. Army Engineer School and STRICOM Engineer Battle Testbed, and 3) numerous battlespace effects implemented for use in JointSAF (Computer Generated Forces) and ModStealth (OpenScene) simulations. A carefully designed architecture isolates applications from the dynamics of underlying models, allowing for seamless Dynamic Terrain generation.


Deep Water Mines


Surf Zone Obstacles


Dynamic Terrain

Battlespace Environments

- Smoke from burning vehicles, obscurants, and concealment
- Multi-state object models with three or more states
- Atmospheric illumination, haze, clouds, and rain
- Sea spray and ocean waves and tides

Engineering Emplacements

- Littoral zone obstacles like mines, caltrops, and concertina wire
- Mobility obstacles for both tracked and wheeled vehicles
- Minefields and minefield breaching capabilities
- Survivability positions and infantry trenches

High Fidelity Munition Effects

- Weapons penetration of hardened targets and cultural features
- Crater models based on both munition and terrain types
- Physics-based battle damage assessment capability
- Interactively damage and replace buildings

For more information about terrain database generation for M&S applications, contact Ms. Nancy Gardner at Nancy.K.Gardner@erdc.usace.army.mil (703-428-3709) or visit the TEC M&S Terrain web page at http://www.tec.army.mil/research/products/Modeling_Simulation/TDB.html.